CHEMISTRY

BOOKS - VIKRAM PUBLICATION (ANDHRA PUBLICATION)

THE P-BLOCK ELEMENTS GROUP-14

Solved Problems

1. Select the member (s) of group 14 that:- (i)forms the most acidic dioxide ,(ii)is

commonly found in +2 oxidation state, (iii)used as semiconductor .

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2. $[SiF_6]^{2-}$ is known where as $[SiCI_6]^{2-}$ does not exist because

I) Six large chloride ions cannot be accommodated around Si^{4+}

II) Ineraction between lone pair of chloride ion and Si^{4+} is not very strong

III) Silicon is less electronegative than chlorine

IV) Si^{4+} and Cl^{-} ions have same size

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3. Diamond is covalent. Yet it has high melting point Why?

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4. What are silicones ?

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Important Question

1. Are BCl_3 and $SiCl_4$ electron deficient compounds explain.

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2. Give the hybridization of carbon I a)CO_3^{-2} b) diamond c) graphite d) fullerene

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3. What is allotropy ? Give the crystalline allotropes of cabon.

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4. Classify the following oxides as neutral ,acidic basic or amphoteric .

a) CO b) B_2O_3 c) SiO_2 d) CO_2 e) Al_2O_3 f) pbO_2 g) Tl_2O_3

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5. Graphite is a good conductor - explain.

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6. What is 'synthesis gas' ?

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7. Diamond has high melting point - Explain.

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8. How does CO_2 increase the greenhouse effect ?

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9. What is 'producer gas' ?

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10. What are silicones ?

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11. Give the uses of silicones.

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12. SiO_2 is a solid while CO_2 is a gas - explain.

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13. Write the use of ZSM-5.

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14. What is the use of dry ice ?

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15. How is water gas prepared ?

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16. How is producer gas prepared ?

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17. Producer gas is less efficient fuel than water gas - explain.

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18. SiF_6^{2-} is known while $SiCl_6^{-2}$ is not - explain.

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19. Explain the differences in properties of diamond and graphite on the basis of their structures.

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20. Explain the following .a) $PbCl_2$ reacts with Cl_2 to give $PbCl_4$ b)$PbCl_4$ is unstable to heat .c) Lead to not known to form PbI_4

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21. Explain the following.

Silicon is heated with methyl chloride at high temperature in the presence of copper.

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22. What is inert pair effect ?

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23. Write a short note on zeolites.

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24. Write a short note on silicates.

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25. What are silicones ? How are they obtained?

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26. Write a short note on fullerene.

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27. Why is diamond hard ?

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28. What happens when the following are heated ?

$CaCO_3$ and SiO_2

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29. What happen when

CaC_2 is heated with N_2.

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30. Write a note on the allotrophy of carbon.

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31. Write a note on

Silicates.

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Very Short Answer Questions

1. Discuss the variation of oxidation states in the group - 14 elements.

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2. How the following compounds behave with water ?

BCl_3

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3. Are BCl_3 and $SiCl_4$ electron deficient compounds ? Explain.

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4. Give the hybridization of carbon in

CO_3^{2-}

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5. Why is carbon monoxide poisonous ?

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6. What is allotropy ? Give the crystalline allotropes of cabon.

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7. Classify the following oxides as neutral, acidic, basic or amphoteric.

$CO, B_2 \_ 3, SiO_2, CO_2, Al_2O_3, PbO_2, Tl_2O_3$

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8. Name any two man-made silicates.

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9. Write the outer electron configuration of group - 14 elements.

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10. How does graphite function as a lubricant ?

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11. Graphite is a good conductor - explain.

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12. Explain the structure of silica.

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13. What is 'synthesis gas' ?

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14. What is 'producer gas' ?

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15. Diamond has high melting point - Explain.

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16. Give the use of CO_2 in photosynthesis.

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17. How does CO_2 increase the green house effect ?

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18. What are silicones ?

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19. Give the uses of silicones.

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20. What is the effect of water on tin ?

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21. Write an account of $SiCl_4$

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22. SiO_2, is a solid while CO_2 is a gas -explain.

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23. Write the use of ZSM-5.

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24. What is the use of dry ice ?

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25. How is water gas prepared ?

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26. How is producer gas prepared ?

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27. C - C bond length in graphite is shorter than C - C bond length in diamond - Explain.

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28. Diamond is used as precious stone - explain.

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29. Carbon never shows coordination number greater than four while other members of carbon family show coordination number as high as six - explain.

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30. Producer gas is less efficient fuel than water gas - explain.

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31. SiF_6^{2-} is known while $SiCl_6^{-2}$ is not - explain.

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Short Answer Questions

1. Explain the differences in properties of diamond and graphite on the basis of their structures.

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2. Explain the following .a) $PbCl_2$ reacts with Cl_2 to give $PbCl_4$ b)$PbCl_4$ is unstable to heat .c) Lead to not known to form PbI_4

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3. Explain the following.

Silicon is heated with methyl chloride at high temperature in the presence of copper.

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4. What do you understand by

(a) Allotropy (b) Inert pair effect ?

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5. If the starting material for the manufacture of sillicones is $RSiSCl_3$, write the structure of the product formed.

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6. Write a short note on zeolites.

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7. Write a short note on silicates.

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8. What are silicones ? How are they obtained?

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9. Write a short note on fullerene.

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10. Why SiO_2 does not dissolve in water.

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11. Why is diamond hard ?

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12. What happens when the following are heated ?

$CaCO_3$ and SiO_2

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13. Why does Na_2CO_3 solution turn into a suspension, when saturated with CO_2 gas ?

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14. What happen when

CO_2 is passed through slaked lime

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15. Write a note on the anomalous behaviour of carbon in the group-14.

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Long Answer Questions

1. Choose the correct statemet

i)Silicones are the organo Silicon polumers containing R_2 SiO-repeating unit.

ii)these are synthetic compounds containing Si-O-Si preparation :These are formed by the hydrolysis of chlorosilanes.

iii)Methyl chloride reacts withSilicon at high temperature in presence of copper catalyst to form various types of methyl subsituted chlorosilane of formula $MeSiCl_2, Me_2SiCl_2, Me_2SiCl$ With small amount Me_4Si .

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2. Explain the structure of silica. How does it react with

NaOH.

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3. Write a note on the allotrophy of carbon.

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4. Write a brief note on Zeolites & silicates

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